

**✓In the Claims:**

**✓Please cancel claims 1, 3, 8, 11 and 21-26 without prejudice or disclaimer.**

**Please rewrite claims 2, 4-7, 9, 10, 12-15 and 18-20 as follows:**

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2. (Amended) A piezoelectric/electrostrictive element as set forth in claim 27, wherein said piezoelectric/electrostrictive layers are decreased in width gradually in a direction of lamination.
  
4. (Amended) A piezoelectric/electrostrictive element as set forth in claim 27, wherein a width of a portion of said first external electrode layer extending on a portion of said wider surface is greater than the width of a portion of said second external electrode layer extending on a portion of said wider surface.
  
5. (Amended) A piezoelectric/electrostrictive element as set forth in claim 27, wherein any one of said wider and narrower surfaces in a direction of lamination is the piezoelectric/electrostrictive layer.
  
6. (Amended) A piezoelectric/electrostrictive element as set forth in claim 27, wherein the number of said internal electrode layers connecting with said first external electrode layer is identical with the number of said internal electrode layers connecting with said second external electrode layer.
  
7. (Amended) A piezoelectric/electrostrictive element as set forth in claim 27, wherein the number of said internal electrode layers connecting with said first external electrode layer is different from the number of said internal electrode layers connecting with said second external electrode layer.

9. (Amended) A piezoelectric/electrostrictive device as set forth in claim 28, wherein  
said piezoelectric/electrostrictive element is bonded to said movable plate by adhesive  
disposed within at least one gap defined by said first surface and said movable plate, and said  
second surface and said movable plate.

10. (Amended) A piezoelectric/electrostrictive device as set forth in claim 9,  
characterized in that a structure formed from said piezoelectric/electrostrictive element and  
said adhesive is trapezoidal or rectangular parallelepipedic.

12. (Amended) A piezoelectric/electrostrictive device as set forth in claim 28, wherein  
said piezoelectric/electrostrictive element is bonded only to one surface of said movable  
plate.

13. (Amended) A piezoelectric/electrostrictive device as set forth in claim 28, wherein  
said piezoelectric/electrostrictive elements are bonded to two surfaces of the movable plate to  
hold the movable plate therebetween.

14. (Amended) A piezoelectric/electrostrictive device as set forth in claim 28, wherein  
said movable plate comprises an insulating material.

15. (Amended) A piezoelectric/electrostrictive device as set forth in claim 28, wherein  
said movable plate comprises a conductive material.

18. (Amended) A piezoelectric/electrostrictive device comprising a pair of piezoelectric/electrostrictive elements each including a substantially trapezoidal laminate having narrower and wider surfaces lying substantially in parallel to one another and first and second surfaces opposed to one another between the narrower and wider surfaces, the first and second surfaces being inclined at given angles with respect to one of the narrower and wider surfaces, said laminate comprising a plurality of piezoelectric/electrostrictive layers and a plurality of internal electrodes each of which is disposed between an adjacent two of the piezoelectric/electrostrictive layers, the internal electrodes being divided into first and second groups, each of the first group internal electrodes lying over one of the second group internal electrodes and being separated by one of the piezoelectric/electrostrictive layers; a first external electrode formed on the first surface of said laminate, said first external electrode being coupled to the first group internal electrodes; and a second external electrode formed on the second surface of said laminate, said second external electrode being coupled to the second group internal electrodes, wherein said piezoelectric/electrostrictive elements are bonded to one another on sides of the respective narrower surfaces of said laminates.

19. (Amended) A piezoelectric/electrostrictive device as set forth in claim 28, wherein said first and second external electrode layers are connected to a voltage applying circuit.

20. (Amended) A piezoelectric/electrostrictive device as set forth in claim 28, wherein said first and second external electrode layers are connected to a voltage detecting circuit.

**Please add new claims 27 and 28 as follows:**

27. (New) A piezoelectric/electrostrictive element comprising:

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a substantially trapezoidal laminate having narrower and wider surfaces lying substantially in parallel to one another and first and second surfaces opposed to one another between the narrower and wider surfaces, the first and second surfaces being inclined at given angles with respect to one of the narrower and wider surfaces, said laminate comprising a plurality of piezoelectric/electrostrictive layers and a plurality of internal electrodes each of which is disposed between an adjacent two of the piezoelectric/electrostrictive layers, the internal electrodes being divided into first and second groups, each of the first group internal electrodes lying over one of the second group internal electrodes and being separated by one of the piezoelectric/electrostrictive layers;

a first external electrode formed on the first surface of said laminate and extending along the wider surface of said laminate, said first external electrode being coupled to the first group internal electrodes; and

a second external electrode formed on the second surface of said laminate and extending along the wider surface of said laminate, said second external electrode being coupled to the second group internal electrodes.

28. (New) A piezoelectric/electrostrictive device comprising a

piezoelectric/electrostrictive element including a substantially trapezoidal laminate having narrower and wider surfaces lying substantially in parallel to one another and first and second surfaces opposed to one another between the narrower and wider surfaces, the first and second surfaces being inclined at given angles with respect to one of the narrower and wider surfaces, said laminate comprising a plurality of piezoelectric/electrostrictive layers and a plurality of internal electrodes each of which is disposed between an adjacent two of the

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piezoelectric/electrostrictive layers, the internal electrodes being divided into first and second groups, each of the first group internal electrodes lying over one of the second group internal electrodes and being separated by one of the piezoelectric/electrostrictive layers; a first external electrode formed on the first surface of said laminate and extending along the wider surface of the laminate, said first external electrode being coupled to the first group internal electrodes; and a second external electrode formed on the second surface of said laminate and extending along the wider surface of the laminate, said second external electrode being coupled to the second group internal electrodes, *wherein* said piezoelectric/electrostrictive element is bonded to a surface of a movable plate on a side of the narrower surface of said laminate.

*added  
to 27*

## REMARKS

Claims 2, 4-7, 9, 10, 12-20 and 27-28 are pending herein. Claims 1, 3, 8, 11 and 21-26 have been cancelled without prejudice or disclaimer. Claims 3 and 11 have been rewritten in independent form as new claims 27 and 28, respectively. Claims 2, 4-7, 9, 10, 12-15 and 18-20 have been amended for clarification purposes only. The dependencies of claims 2 and 4-7 have been changed to depend from new claim 27. The dependencies of claims 9, 12-15, 19 and 20 have been changed to depend from new claim 28. Attached hereto as pages 11-13, pursuant to Rule 1.121(c)(1)(ii), is a marked-up version of the amended claims.

1. Applicants affirm the provisional election to prosecute claims 1-20. Claims 21-26 have been withdrawn from consideration as being drawn to a non-elected invention, and thus have been cancelled without prejudice or disclaimer. Applicants reserve the right under 35 USC §121 to file a divisional application for the non-elected claims.

2. Claims 5 and 18-20 were rejected under §112, second paragraph. With reference to Fig. 25 of the present application, claim 5 has been amended to clarify that either one of the wider (f1) or narrower (f2) surfaces is a piezoelectric/electrostrictive layer. Fig. 25 illustrates an example where insulating layer (73) is formed on narrower surface (f2) of P/E element (60).

With respect to claims 18-20, Fig. 10 of the present application illustrates that two P/E elements (10) are bonded to one another along narrower surface portions (the portions near elements 14C) via adhesive (22). Accordingly, the P/E element laminates are bonded directly to one another, and are not bonded to plate (21), which is shown in Fig. 9 and corresponds to claim 13, as asserted in the Office Action.

In view of the foregoing, reconsideration and withdrawal of the §112, second paragraph, rejections of claims 5 and 18-20 are respectfully requested.

3. Claims 1-20 were rejected under §103(a) over Culp (U.S. Patent No. 5,182,484) or Culp (U.S. Patent No. 5,939,816) in view of Jomura et al. The cancellation of claims 1 and 8 renders this rejection moot with respect to those claims. To the extent that this

rejection might be applied against new claims 27 and 28, and original claim 18, it is respectfully traversed.

With reference to Fig. 4 of the present application, original claim 18 and new claims 27 and 28 each recite, among other things, that first and second surfaces (e.g., 14A and 15A) of trapezoidal P/E laminate (10) are inclined at given angles with respect to one of the narrower and wider surfaces (f2) and (f1), respectively. New claims 27 and 28 further recite that first and second external electrodes (e.g., 14 and 15) are formed on the first and second surfaces, respectively. The first and second external electrodes each extend along portions of the wider surface (f1) of the laminate.

With reference to Fig. 10 of the present application, claim 18 further recites that trapezoidal P/E element laminates (10) are bonded to one another via adhesive (22) along narrower surface portions (e.g., the portions closest to element 14C) of the laminates.

By forming the external electrodes to extend along the wider surface of the P/E laminate, a joint area or pad portion is provided to advantageously facilitate the connection of the electrode wires on the same surface (page 7, lines 9-20 of the present application). This eliminates the prior art requirement of using individual electrode wires extending outwardly from a side surface of the P/E element laminate structure, as shown in Fig. 1 of Culp '484, discussed below. Moreover, by forming the external electrodes to extend along the wider surface of the laminate, the electrodes of the laminate can be more easily electrically connected to, for example, a flexible printed surface (FPC), a flexible flat cable (FFC) or bonding wire structures (see page 54, lines 7-13 of the present application).

Culp '484 discloses a releasing linear actuator. With reference to Fig. 1 of Culp '484, a two-axis actuator (2) includes lifter and tangenter layered actuator body portions (10) and (12), respectively, interposed between mounting base surface portion (4) and traction surface portion (6). The layered actuator body portions (10) and (12) are connected to an electrical source by two pairs of wire leads (22) (column 3, lines 50-52 of Culp '484). While one pair of wire leads extends from lifter body portion (10), the other pair of wire leads extends from tangenter portion (12).

As is clearly shown in all of the drawings in Culp '484, both side surface portions of the two-axis actuator (2) are not inclined with respect to one of the wider and narrower surface portions. As explained above, pending claims 18, 27 and 28 each recite that "the first and second surfaces" of the trapezoidal P/E laminate are inclined at given angles with respect to one of the narrower and wider surfaces of the laminate. Accordingly, even if Culp '484 and Jomura were combined as asserted in the Office Action, the resultant structure would still fail to include a structure wherein both of the first and second surfaces of the laminate are inclined at given angles with respect to one of the narrower and wider surfaces of the laminate, as recited in claims 18, 27 and 28.

Moreover, Culp '484 does not disclose or suggest bonding two of Culp's actuators (2) to one another along narrower surface portions of the actuators, as recited in claim 18. As is correctly understood by the PTO, Fig. 2 of Culp '484 clearly shows that two of Culp's actuators are bonded to element 28, and therefore, are not bonded to one another along narrower surface portions of the actuators. There is no disclosure in Culp '484, or any of the cited references for that matter, of P/E laminates that are "bonded to one another on sides of the respective narrower surfaces of said laminates," as recited in claim 18.

With respect to the PTO's asserted combination of Culp '816 and Jomura, as is clearly shown in the relevant drawings in Jomura (Fig. 1A, 4 and 5, for example), external electrodes 3a and 3b do not extend along any portion of the same surface of Jomura's laminate structure. Skilled artisans would be lead to believe that the external electrodes disclosed in Jomura are required to be on separate side surfaces of Jomura's P/E laminate. New claims 27 and 28, however, each recite that first and second external electrodes are formed on the first and second surfaces of the laminate, respectively, and extend along the wider surface of the laminate. As explained above, this structure beneficially provides a pad portion on one surface, which facilitates the connection of the electrodes. Accordingly, even if Culp '816 and Jomura were combined as asserted in the Office Action, the resultant structure would still fail to disclose or suggest the "extending along the wider surface of said laminate" limitation recited in new claims 27 and 28.

With respect to independent claim 18, similar to Culp '484 discussed above, there is no disclosure or suggestion in Culp '816 of bonding two of Culp's laminate stacks 32 (shown in Fig. 4 of Culp '816, for example) to one another along narrower surface portions of the laminate, as recited in claim 18. The drawings in Culp '816 clearly show that Culp's laminate stacks 32 are required to be bonded to a support structure (e.g., slab-like object 38 shown in Fig. 4 of Culp '816).

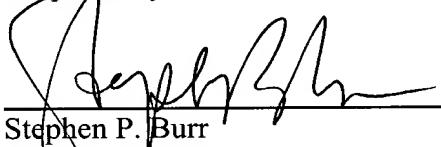
In view of all of the foregoing, reconsideration and withdrawal of the rejection of claim 18 under §103(a) over Culp '484 or Culp '816 in view of Jomura are respectfully requested. Applicants respectfully submit that new independent claims 27 and 28, and all claims depending therefrom, define patentable subject matter over Culp '484, Culp '816 and Jomura et al.

***The Examiner is requested to confirm receipt and consideration of the Information Disclosure Statements filed on July 23, 2002 and August 23, 2002.***

If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

  
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Stephen P. Burr  
Reg. No. 32,970

October 3, 2002

Date

SPB/SC/tlp

BURR & BROWN  
P.O. Box 7068  
Syracuse, NY 13261-7068

Customer No.: 025191  
Telephone: (315) 233-8300  
Facsimile: (315) 233-8320